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INFOCOMMUNICATION TECHNOLOGIES IN TELEMEDICINE

Abstract. The article is devoted to the consideration a field of medicine - telemedicine. The article presents the ways of using infocommunication technologies in medicine.

Keywords: infocommunication technologies, telemedicine, telemedicine technologies, medicine, teleconsultation.

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ИНФОКОММУНИКАЦИОННЫЕ ТЕХНОЛОГИИ В МЕДИЦИНЕ

Аннотация. *Статья посвящена рассмотрению такой области медицины, как телемедицина. В статье представлены способы использования инфокоммуникационных технологий в медицине.*

Ключевые слова: *инфокоммуникационные технологии, телемедицина, телемедицинские технологии, медицина, телеконсультация.*

Telemedicine is a branch of medicine based on the use of computer and telecommunication technologies for the exchange of medical information between specialists in order to improve the quality of diagnosis and treatment of specific patients.

In a pandemic, visiting clinics and hospitals is not safe, but a doctor's consultation is sometimes necessary. But there is not always a need for a face-to-face consultation. Sometimes a full discussion of the clinical manifestations of the disease by attending a physician with colleagues from a specialized institution or with doctors of the central hospital is sufficient, which makes it possible to replace the need for a consultant to be sent to the regional center using air ambulance. And the use of resource-saving telemedicine technologies can provide invaluable assistance in this.

Telemedicine technologies are medical and diagnostic consultations, management, educational, scientific and educational activities in the field of healthcare, implemented using telecommunication technologies («medicine at a distance» or «remote medicine»).

The development of telemedicine technologies is based on advanced information and telecommunication technologies.

Telemedicine is one of the most promising and rapidly developing areas in medicine; however, for the successful functioning of telemedicine systems, the following items are necessary:

• application of special equipment for collecting, transforming and transmit medical information;

• availability of telecommunication networks that will provide communication between doctors and patients;

• qualified specialists: doctors, programmers, communications, etc. providing professional and technical support.

In addition, it is necessary to use certain operating modes of equipment, use specific formats of medical data and information exchange protocols, and so on.

Telemedicine, being from a formal point of view a direct continuation of the pre-existing remote diagnostics, is developing on a qualitatively different technological

basis and involves communication possibility between specialists, including the analysis of static (radiographs, ECG, EEG, etc.) and dynamic (video and audio fragments) information about the patient. The possibility of joint discussion of the entire medical data complex is provided by a video conferencing system that provides audio and video exchange in real time.

The main areas of telemedicine technologies application are:

1) Medical databases (combined databases of scientific medical information, specialized medical databases);
2) Teleconsultations (delayed teleconsultation systems, teleconsultation systems in videoconference mode)
3) Distance learning (graduate education, postgraduate education)
4) Home telemedicine;
5) Specialized telemedicine projects (military telemedicine, space telemedicine, telemedicine of emergencies and disasters).

The design of telemedicine systems is influenced by specific requirements for each application. Today there are no clearly defined building standards. Telemedicine systems should have an open interface that allows to change the storage and transmission formats for different working conditions. In addition, the open interface assumes the ability to quickly and easily connect to any newly created medical equipment.

Telemedicine systems that have all of the above capabilities are capable of providing both telemedicine consultations in various areas of diagnosis and treatment, and distance medical education.

Home telemedicine is now the main focus of telemedicine.

Treating patients at home has many advantages: there are fewer patients in the hospital, patients are in their usual calm home environment and have a more active lifestyle.

Home telemedicine provides an opportunity for long-term continuous monitoring and remote control of the patient's heath state. At the same time, medical devices - blood pressure and pulse meters, electrocardiographs, spirographs, portable

analyzers of glucose, cholesterol levels, etc. - are connected to small personal communication devices that transmit information for processing to specialized medical consoles. As a transmission channel, a cellular or "regular" telephone system is often used.

The main advantage of personal home monitoring systems is that they avoid subjective judgments. These devices become indispensable in the event of an unexpected deterioration in the patient's condition. If necessary, personal communication devices can be equipped with a system for determining the location, which allows, together with information about the condition, to transmit the exact coordinates of the patient to medical personnel.

However, telemedicine technologies are also used in clinical medicine. The following directions in practical health care can be distinguished:

• initial diagnosis of the patient's condition in emergency cases to coordinate treatment;

• referring to nursing staff in the absence of a doctor;

• consultations and councils;

• monitoring the patients whose condition is assessed as critical or chronic.

Today telemedicine technologies are one of the most innovative areas of medicine. The main purpose of telemedicine is to make medical care more accessible and qualified, while, as a result, the entire healthcare sector will change, since the capabilities of telemedicine will make it possible to receive quality medical services anywhere in the world. This means improving the quality of life.

Currently, the need for the development of telemedicine is recognized in all the leading countries of the world. Projects related to the formation of a telemedicine network are among the most important medical programs funded by the European Community. Telemedicine methods are also being actively developed in Latin and South America and Asia. The agenda also includes the issue of introducing the achievements of telemedicine into regular Russian healthcare.

REFERENCES

1. Ahmed Hamdy Ashry, Mohamed Fathalla Alsawy. Doctor-patient distancing: an early experience of telemedicine for postoperative neurosurgical care in the time of COVID-19. – 2020. – Text: electronic. – URL: https://ejnpn.springeropen.com/articles/10.1186/s41983-020-00212-0 (Reference date 19.12.2020).

2. Monica Brova, Krislyn M. Boggs, Kori S. Zachriso, Rachel D. Freid, Ashley F. Sullivan MS, Janice A. Espinola, Tehnaz P. Boyle, Carlos A. Camargo Jr. Pediatric Telemedicine Use in United States Emergency Departments. – 2018. – Text: electronic. – URL: https://onlinelibrary.wiley.com/doi/full/10.1111/acem.13629 (Reference date 19.12.2020).

3. Andrew Phillip Maurice, Jaisil Eldo Joseph Punnasseril, Sarah Emily King, Benjamin Rees Dodd. Improving Access to Bariatric Surgery for Rural and Remote Patients: Experiences from a State-Wide Bariatric Telehealth Service in Australia. – 2020. – Text: electronic. – URL: https://link.springer.com/article/10.1007/s11695-020-04804-w (Reference date 19.12.2020).

4. Hedieh Sajedi, Shabnam Rahbar Yaghobi. Information hiding methods for E-Healthcare. – 2020. – Text: electronic. – URL: https://www.sciencedirect.com/science/article/abs/pii/S2352648317300016?via%3Dihub (Reference date 19.12.2020).